What is claimed is:

1. A position-burst demodulator, comprising:

an input circuit operable to receive and square first and second samples of a first servo position burst;

an intermediate circuit coupled to the input circuit and operable to add the squared first and second samples to generate a first sum; and

an output circuit coupled to the intermediate circuit and operable to calculate the square root of the first sum.

2. The demodulator of claim 1 wherein the first and second samples comprise consecutive samples.

3. The demodulator of claim 1 wherein the first and second samples comprise average samples.

4. The position-burst demodulator of claim 1, further comprising:

wherein the input circuit is operable to receive and square first and second samples of a second servo position burst;

wherein the intermediate circuit is operable to add the squared first and second samples of the second servo position burst to generate a second sum;

wherein the output circuit is operable to calculate the square root of the second sum; and

a difference circuit operable to calculate a difference between the square roots of the first and second sums.

5. A position-burst demodulator, comprising:

a first adder operable to receive first and second sets of samples of a first servo position burst, to add the samples in the first set together to generate a first sum, and to add the samples in the second set together to generate a second sum;

a power circuit coupled to the first adder and operable to square the first sum and the second sum to respectively generate first and second squared sums;

a second adder coupled to the squarer and operable to add the first and second squared sums to generate a first sum of squares; and

a root circuit coupled to the second adder and operable to calculate the square root of the first sum of squares.

6. The demodulator of claim 5 wherein:

the first and second sets of samples together represent a string of samples;

the samples in one of the first and second sets are even samples of the string; and

the samples in the other of the first and second sets are odd samples of the string.

7. The demodulator of claim 5 wherein the first adder is operable to add the magnitudes of the samples in the first set together to generate the first sum and to add the magnitudes of the samples in the second set together to generate the second sum.

8. The position-burst demodulator of claim 5, further comprising:

wherein the first adder is operable to receive first and second sets of samples of a second servo position burst, to add the samples in the first set together to generate a third sum, and to add the samples in the second set together to generate a fourth sum;

wherein the power circuit is operable to square the third sum and the fourth sum to respectively generate third and fourth squared sums;

wherein the second adder is operable to add the third and fourth squared sums to generate a second sum of squares;

wherein the root circuit is operable to calculate the square root of the second sum of squares; and

a difference circuit coupled to the root circuit and operable to calculate a difference between the square roots of the first and second sums of squares.

9. The position-burst demodulator of claim 5, further comprising:

wherein the first adder is operable to receive first and second sets of samples of a second servo position burst, to add the samples in the first set together to generate a third sum, and to add the samples in the second set together to generate a fourth sum;

wherein the power circuit is operable to square the third sum and the fourth sum to respectively generate third and fourth squared sums;

wherein the second adder is operable to add the third and fourth squared sums to generate a second sum of squares;

wherein the root circuit is operable to calculate the square root of the second sum of squares;

a memory operable to store the square roots of the first and second sums of squares; and

a difference circuit coupled to the memory and operable to calculate a difference between the stored square roots of the first and second sums of squares.

10. A circuit operable to:

square first and second samples of a first servo position burst;

add the squared first and second samples to generate a first sum; and

calculate the square root of the first sum.

11. The circuit of claim 10, further operable to:

square first and second samples of a second servo position burst;

add the squared first and second samples of the second servo position burst to generate a second sum;

calculate the square root of the second sum; and

calculate a difference between the square roots of the first and second sums.

12. A circuit operable to:

receive fewer than ten samples per cycle of a first servo position burst;

receive fewer than ten samples per cycle of a second servo position burst; and

calculate a head-position error signal from the samples of the first and second bursts such that the accuracy of the error signal is independent of the timing of the samples with respect to the bursts.

13. The circuit of claim 12, further operable to generate the samples of the first and second servo position bursts.

14. A disk-drive system, comprising:

a data-storage disk having a surface, data tracks defined on the surface, the data tracks having respective centers, the data-storage disk also having servo wedges located in the tracks, each servo wedge including position bursts;

a motor coupled to and operable to rotate the disk;

a read head operable to generate a read signal that represents the position bursts;

a read-head positioning circuit operable to move the read head toward the center of a data track in response to a position-error signal; and

a servo circuit coupled to the read head and to the read-head positioning system, the servo circuit operable to

sample the read signal,

square first and second samples of both a first position burst and a second position burst in a servo wedge located in the data track,

add the squared first and second samples of the first position burst to generate a first sum and add the squared first and second samples of the second position burst to generate a second sum,

calculate a first square root of the first sum and a second square root of the second sum,

calculate a difference between the first and second square roots, and

generate the position-error signal equal to the difference.

15. A disk-drive system, comprising:

a data-storage disk having a surface, data tracks defined on the surface, the data tracks having respective centers, the data-storage disk also having servo wedges located in the tracks, each servo wedge including position bursts;

a motor coupled to and operable to rotate the disk;

a read head operable to generate a read signal that represents the position bursts;

a read-head positioning circuit operable to move the read head toward the center of a data track in response to a position-error signal; and

a servo circuit coupled to the read head and to the read-head positioning system, the servo circuit operable to

sample the read signal fewer than ten times per cycle of the position bursts, and

calculate the position-error signal from the samples such that the accuracy of the position-error signal is independent of the timing of the samples with respect to the read signal.

16. A method, comprising:

squaring first and second samples of a first servo position burst;

generating a first sum by adding the squared first and second samples together; and

calculating the square root of the first sum.

17. The method of claim 16, further comprising generating the first and second samples by respectively setting the first and second samples equal to averages of first and second sets of samples.

18. The method of claim 16, further comprising generating the first and second samples by respectively setting the first and second samples equal to averages of first and second interleaved sets of samples.

19. The method of claim 16, further comprising:

squaring first and second samples of a second servo position burst;

generating a second sum by adding the squared first and second samples of the second servo position burst together;

calculating the square root of the second sum; and

calculating a difference between the square roots of the first and second sums.

20. A method, comprising:

receiving first and second sets of samples of a first servo position burst;

adding the samples in the first set together to generate a first sum;

adding the samples in the second set together to generate a second sum;

squaring the first and second sums to respectively generate first and second squared sums;

adding the first and second squared sums together to generate a first sum of squares; and

calculating the square root of the first sum of squares.

21. The method of claim 20, further comprising:

generating one of the the first and second sets of samples by sampling the first servo position burst every other sampling time; and

generating the other of the first and second sets of samples by sampling the first servo position burst at the remaining sampling times.

22. The method of claim 20 wherein:

adding the samples in the first set comprises adding the magnitudes of the samples in the first set together to generate the first sum; and

adding the samples in the second set comprises adding the magnitudes of the samples in the second set together to generate the second sum.

23. The method of claim 20, further comprising:

receiving first and second sets of samples of a second servo position burst;

adding the samples in the first set together to generate a third sum;

adding the samples in the second set together to generate a fourth sum;

squaring the third sum and the fourth sum to respectively generate third and fourth squared sums;

adding the third and fourth squared sums to generate a second sum of squares;

calculating the square root of the second sum of squares; and

calculating a difference between the square roots of the first and second sums of squares.

24. A method, comprising:

receiving fewer than ten samples per cycle of a first servo position burst;

receiving fewer than ten samples per cycle of a second servo position burst; and

calculating a head-position error signal from the samples of the first and second bursts such that the accuracy of the error signal is independent of the location of the samples with respect to the bursts.

25. The method of claim 24, further comprising generating the samples of the first and second servo position bursts.

26. A method, comprising:

generating a read signal with a read head, the read signal representing position bursts on a data-storage disk;

sampling the read signal;

squaring first and second samples of both a first position burst and a second position burst located in a data track of the disk;

adding the squared first and second samples of the first position burst to generate a first sum;

adding the squared first and second samples of the second position burst to generate a second sum;

calculating a first square root of the first sum;

calculateing a second square root of the second sum;

calculating a difference between the first and second square roots;

generating the position-error signal equal to the difference; and

moving the read head toward the center of the data track in response to the position-error signal.

27. A method, comprising:

generating a read signal with a read head, the read signal representing position bursts on a data-storage disk;

sampling the read signal fewer than ten times per position-burst cycle;

calculating a position-error signal from the samples such that the accuracy of the position-error signal is independent of the timing of the samples with respect to the read signal; and

moving the read head toward the center of a data track on the disk in response to the position-error signal.